

## Pontics and the Edentulous Ridge

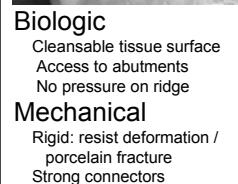
Donna N. Deines, DDS, MS  
Resources: Shillingburg et al  
Rosenstiel et al  
Eissmann, H.F.

### Pontic Design and the Edentulous Ridge



#### Esthetic

Appearance of replacement  
"Grows" from edentulous ridge  
Space for porcelain



#### Biologic

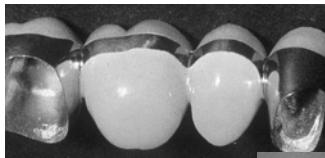
Cleansable tissue surface  
Access to abutments  
No pressure on ridge



#### Mechanical

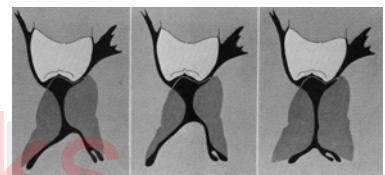
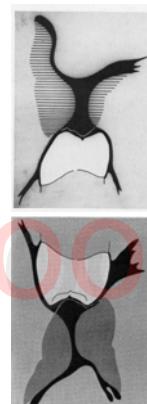
Rigid: resist deformation /  
porcelain fracture  
Strong connectors

### Pontic Materials and Design



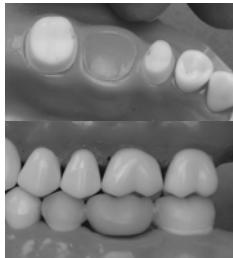
- Glazed porcelain
- Highly polished gold
- M-C finish line: not on edentulous ridge
- Acrylic resin (porous) – poor surface
- Proper design most important

### Alveolar Ridge Resorption



Edentulous space defined by its boundaries:  
Edentulous ridge, opposing occlusion,  
tongue and cheek.

### Alveolar Ridge Resorption (Minimal)



- Broad ridge / vertical height
  - Uncommon
  - Can compromise occlusocervical dimension →
    - decreased strength of restoration
    - limits restoration possibilities

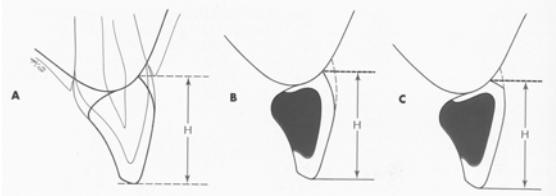
### Changes in the edentulous ridge



- Alveolar resorption and remodeling
  - Apical and facial resorption
  - Greater with trauma / periodontal disease
- Pontic or tissue modifications for esthetics



#### Pontic Contour Changes with Ridge Resorption



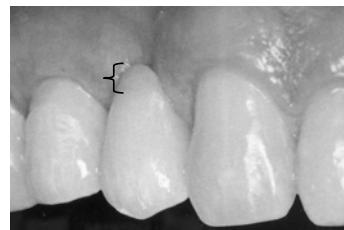
- A pontic should have the same incisogingival height as original (or contralateral) tooth.
- With resorption, the pontic becomes longer in order to contact the ridge concavity.
- Contour must be blended smoothly to avoid a ledge at the cervical.

#### Esthetic Modification: Gingival Contour of Pontic



- Contour in apical ½ should approximate length of adjacent teeth.

#### Esthetic Modification: Gingival Contour of Pontic

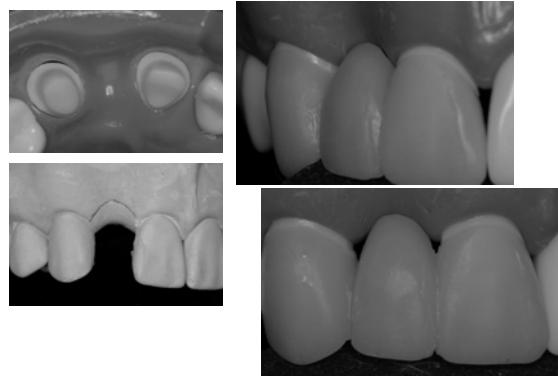


- Contour in apical ½ should approximate length of adjacent teeth.
- The facial surface must be altered to curve gently from the G-F angle to the middle of facial surface

#### Esthetic Modification of Pontic Contour



#### Esthetic Modification of Pontic Contour



### Biological Considerations: Ridge Contact



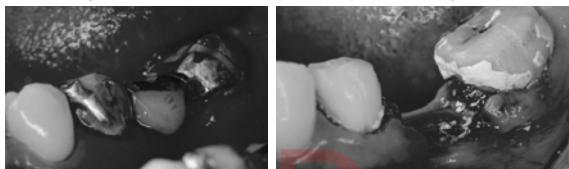
- Any contact should be pressure-free
- Keratinized attached tissue
- No contact with ridge if possible or smallest possible area with convex pontic surface

### Tissue Contact of Pontic



Contact on non-keratinized mucosa / low frenum attachment must be adjusted to avoid ulceration.

### Ridge-Lap and Tissue Impingement



- Pressure by pontic → tissue necrosis
- Keratinized tissue contact only
- Avoid non-keratinized tissue and frenum attachments.
- Floss should pass through without resistance.



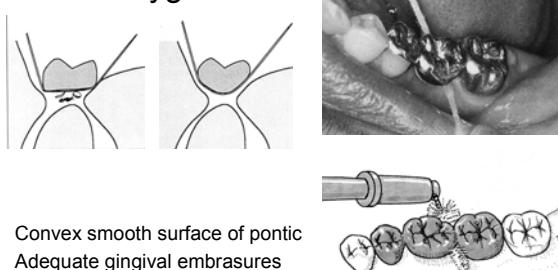
- Severe ridge lap of pontic prevents cleaning.
- Pontic pressure causes tissue ischemia and necrosis.

### Tissue Contact of Esthetic Pontics



- Area of contact small and convex.
- No space between pontic and soft tissue of facial side of ridge
- Contact on attached keratinized gingiva only
- No pressure on the ridge

### Oral Hygiene



- Convex smooth surface of pontic
- Adequate gingival embrasures
- Patient education and hygiene aids
  - Floss threader; Super-floss / gauze; Proxy-brush

- Connectors and pontic contours must not impinge on gingival tissue → gingival inflammation / recession / necrosis.
- Yet there must be adequate thickness for strength
- Strength properties of materials

### Mechanical Considerations

- Strength: thickness of pontic / connector
- Material: metal > metal-ceramic > ceramic
- Position: straight line as possible
- Occlusion: normal centric contacts
  - Occlusal table commensurate with occlusion
  - Narrowing pontic ≠ decreased occlusal force

### Pontic Designs

### Hygienic Pontic (Non-Esthetic)

- No contact with the residual ridge
- ~2mm space between apical portion of pontic and ridge (tissue proliferation if too close)
- At least 3mm thick for strength
- Convex contour FL / MD ('fishbelly')

### Modified Hygienic Pontic ("Perel")

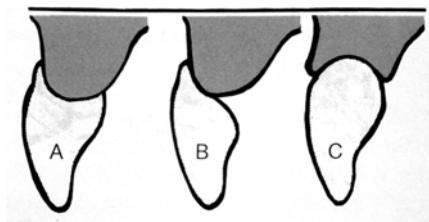
- Increased strength in connectors
- Decreased deflection with decreased O-C height

### Conical Pontic

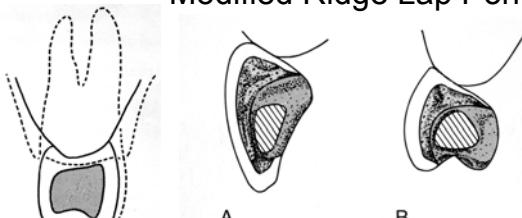
- Small convex area of contact at center of ridge.
  - Easy to clean / comfortable for patient
- Facial / lingual contours depend on residual ridge width

## Esthetic Pontic Designs

- Ridge Lap
- Modified Ridge Lap
- Ovate



## Modified Ridge Lap Pontic



Ridge-lap Pontic:  
Not cleansable

## Modified Ridge Lap Pontic



- Ridge contact on the facial half of ridge
- Contour of tissue-contacting area is convex
- Slight faciolingual concavity on facial side of ridge
- Tissue contact resembles a "T"



Intimate tissue contact on facial helps prevent debris accumulation



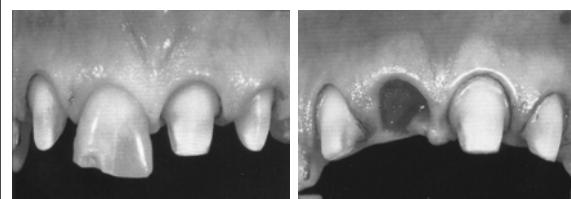
## Ovate Pontic Design



- Blunt / rounded apex set into ridge concavity
- Broad flat (rounded) ridge
- Concavity formed by:
  - Immediate provisional restoration
  - Surgical creation

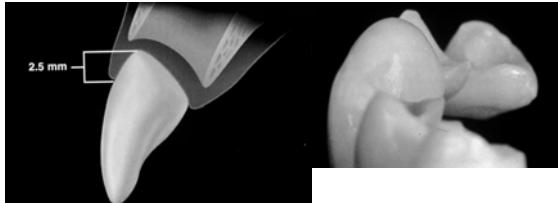


## Ovate Pontic: Immediate Provisional FPD



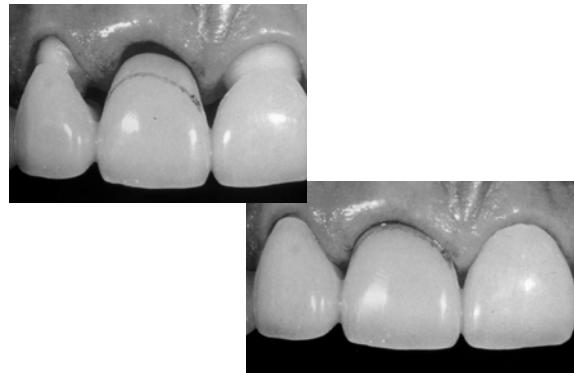
- Adjacent teeth prepared as abutments for FPD
- TE with fiberotomy / rotational motion to protect the facial bone.

### Ovate Pontic: Immediate Provisional FPD

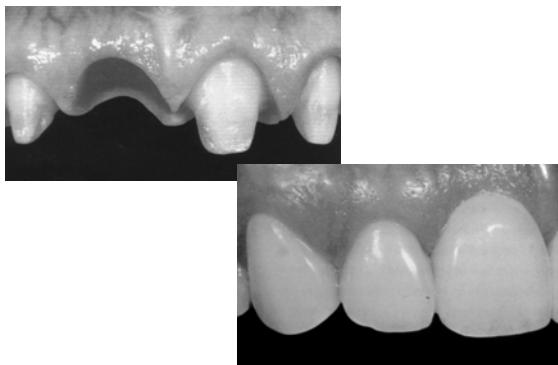


- Facial contour extends 2.5 mm apical to FGM; reduced to 1mm – 1.5mm at 4 weeks

### Ovate Pontic: Immediate Provisional FPD

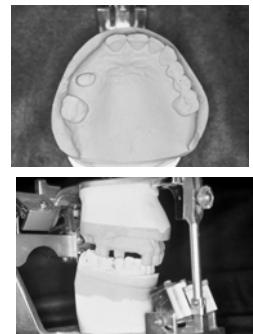


### Ovate Pontic: Immediate Provisional FPD



### Pre-Treatment Assessment

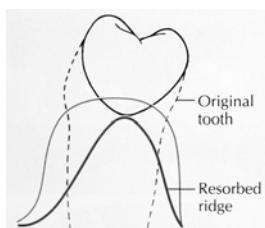
- Pontic Space
  - M-D space (tipping)
  - I-G space (supraeruption)
  - Orthodontics
  - Diagnostic Waxing
- Residual Ridge Contour
  - Pontic modifications
  - Surgical modifications
  - Gingival architecture preservation



### Residual Ridge Deformities

Siebert, JS (*Compend Contin Educ Dent* 4:437, 1983)

- Class I: Faciolingual (32%)
- Class II: Ridge height (3%)
- Class III: Height and width (56%)
- (No defect ~ 4%)



Lateral resorption → narrow ridge  
Vertical resorption → ridge height defect

### Pontic Modifications:



- Vertical resorption requires excessive pontic length
- Contour retainers / pontics normally: shape and stain pontic extension to simulate root surface.

**Pontic Modifications:**  
"Black Triangles" – open embrasures / resorption



- Unesthetic loss of interdental papillae with ridge resorption
- Plaque accumulation
- Interference with flossing
- May reduce rigidity of pontic span

**Narrow faciolingual ridge width  
"knife-edge ridge"**



- Esthetic problems
- Cleansability usually not a problem

**Pontic Modifications**



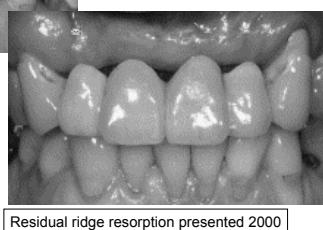
**Esthetic Modification of Pontic Contour**



- Apparent shortening of crown with cervical shading
- Pink porcelain to simulate gingivae
- Decreased embrasure space with cervical contouring

**Management of deficient ridge with shaded gingival porcelain**

Malament, KA and Neeser, S  
*Dent Clin N Am* 2004 735-44

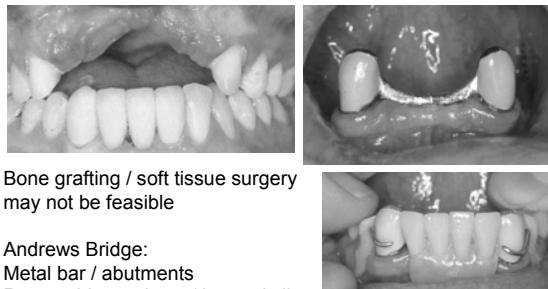


**Management of deficient ridge with shaded gingival porcelain**

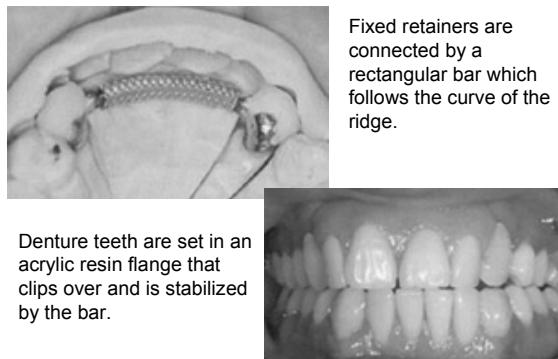
Malament, KA and Neeser, S  
*Dent Clin N Am* 2004 735-44



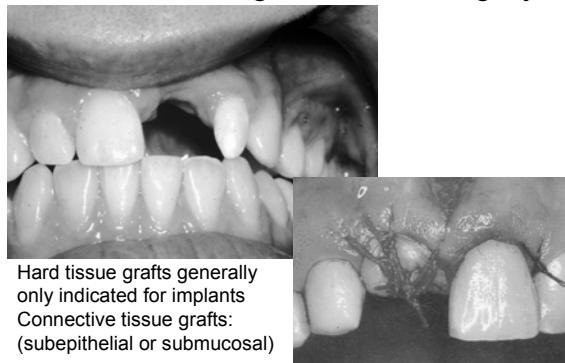
### Gross Tissue Defects Trauma / Ablation Surgery



### “Andrews Bridge”



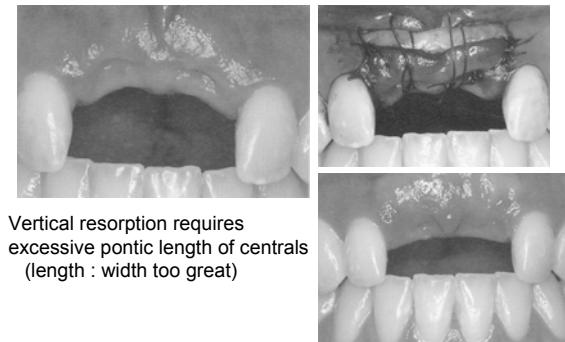
### Soft Tissue Augmentation Surgery



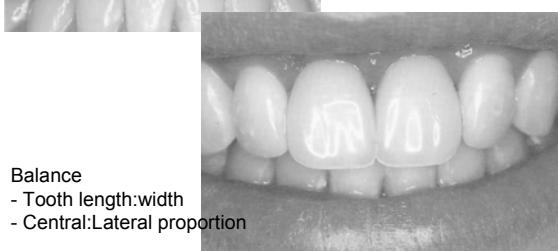
### Ovate Pontic: Surgical Augmentation



### Soft-Tissue Augmentation Surgery



### Post-surgical Ridge Augmentation



Balance  
- Tooth length:width  
- Central:Lateral proportion